Novel Analogues of Fenoterol as Liver and Brain Cancer Therapies

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Keywords: Therapeutic, cancer, liver, brain, colon, lung, fenoterol, MNF, GPR55

Summary:
The National Institute on Aging, Laboratory of Clinical Investigation, is seeking statements of capability or interest from parties interested in collaborative research to further co-develop naphthylfenoterol for the treatment of brain, liver, lung, and colon carcinomas.

Technology:
Available for collaborative research and co-development are specific fenoterol analogues, such as (R,R')-4-methoxy-1-naphthylfenoterol (MNF), that inhibit the growth of various types of cancers, including brain, liver, colon, and lung tumors. MNF acts as an agonist of the GPR55 cannabinoid (CB) receptor and, as such, represents one of the first potential drugs directed at this target. MNF crosses the blood brain barrier and initial toxicity studies indicate that it has few off-target effects. These new analogues can be used to treat CB receptor related disorders and diseases, and in particular GRP55-related disorders and diseases, including brain and liver cancers for which there are no current effective treatments.

Potential Commercial Applications:
- A new class of compounds that can be used to treat cannabinoid receptor related disorders and diseases.
- Treatments for liver, brain, colon, and lung cancers.

Competitive Advantages:
- Able to cross the blood-brain barrier.
- Few Side effects
- Broad range of therapeutic activity.
- Can be formulated for oral administration.

Development Stage: Pre-clinical, *in vitro* and *in vivo* animal data available

Patent Status: US provisional application 61/651,961 filed 25 May 2012.

Publications:
1). Paul RK, RamamoorthyA, Sheers J, Wersto RP, Toll L, Jimenez L, Bernier M, Wainer IW. Cannabinoid receptor activation correlates with the pro-apoptotic action of the Beta-2-adrenergic agonist (R,R')-4'-methoxy-1-naphthylfenoterol. J Pharmacol. Exp. Ther., in press
2). Paul RK, Indig FE, Moaddel R, Bernier M, Wainer IW. Negative regulation of GPR-55 mediated ligand uptake and cellular motility by (R,R')-4'-methoxy-1-napthylfenoterol. Br. J. Pharmacol., in preparation

3). Paul RK, Paris A, Indig FE, Zhang Y, Sanghvi M, Becker K, Moaddel R, Cloix JF, Bernier M, Wainer IW. The role of GPR55 in apoptotic signaling pathways in (R,R')-4'-methoxy-1-naphthylfenoterol, Cancer Res., in preparation.

Contact:
Nikki Guyton, Ph.D.
Tel.: (301) 435-3101
Email: darackn@mail.nih.gov.

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